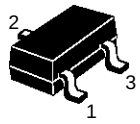
SGS-THOMSON MICROELECTRONICS

BCW31/32

SMALL SIGNAL NPN TRANSISTORS

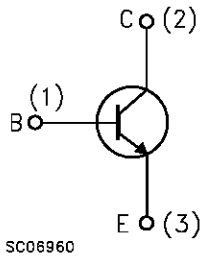
Type	Marking
BCW31	D1
BCW32	D2

- SILICON EPITAXIAL PLANAR NPN TRANSISTORS
- MINIATURE PLASTIC PACKAGE FOR APPLICATION IN SURFACE MOUNTING CIRCUITS
- LOW LEVEL AUDIO AMPLIFICATION AND SWITCHING



SOT-23

INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Base Voltage (I_E = 0)	32	V
V_{CEO}	Collector-Emitter Voltage (I_B = 0)	32	V
V_{EBO}	Emitter-Base Voltage (I_C = 0)	5	V
I_C	Collector Current	0.1	A
I_{CM}	Collector Peak Current	0.2	A
P_{tot}	Total Dissipation at T_c = 25 °C	300	mW
T_{stg}	Storage Temperature	-65 to 150	°C
T_j	Max. Operating Junction Temperature	150	°C

THERMAL DATA

$R_{thj\text{-}amb}$ •	Thermal Resistance Junction-Ambient	Max	420	°C/W

• Mounted on a ceramic substrate area = 10 x 8 x 0.6 mm

ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector Cut-off Current (I_E = 0)	V_{CE} = 30 V V_{CE} = 30 V T_{amb} = 150 °C			100 10	nA µA
$V_{(BR)CBO}$*	Collector-Base Breakdown Voltage (I_E = 0)	I_C = 10 µA	32			V
$V_{(BR)CEO}$*	Collector-Emitter Breakdown Voltage (I_B = 0)	I_C = 2 mA	32			V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage (I_C = 0)	I_C = 10 µA	5			V
$V_{CE(sat)}$*	Collector-Emitter Saturation Voltage	I_C = 10 mA I_B = 0.5 mA I_C = 50 mA I_B = 2.5 mA		 0.23	0.25	V V
$V_{BE(sat)}$*	Base-Emitter Saturation Voltage	I_C = 10 mA I_B = 0.5 mA I_C = 50 mA I_B = 2.5 mA		0.75 0.87		V V
$V_{BE(on)}$*	Base-Emitter On Voltage	I_C = 2 mA V_{CE} = 5 V	0.55		0.7	V
h_{FE}*	DC Current Gain	I_C = 10 µA V_{CE} = 5 V for **BCW31** for **BCW32** I_C = 2 mA V_{CE} = 5 V for **BCW31** for **BCW32**	 110 200	 90 150 	 220 450	
f_T	Transition Frequency	I_C = 10 mA V_{CE} = 5 V f = 100MHz		300		MHz
C_{CB}	Collector Base Capacitance	I_E = 0 V_{CB} = 10 V f = 1 MHz			4.5	pF
NF	Noise Figure	V_{CE} = 5 V I_C = 0.2 mA f = 1KHz Δf = 200 Hz R_G = 2 KΩ			10	dB

* Pulsed: Pulse duration = 300 µs, duty cycle ≤ 2 %

SOT-23 MECHANICAL DATA

DIM.	mm			mils		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	0.85		1.1	33.4		43.3
B	0.65		0.95	25.6		37.4
C	1.20		1.4	47.2		55.1
D	2.80		3	110.2		118
E	0.95		1.05	37.4		41.3
F	1.9		2.05	74.8		80.7
G	2.1		2.5	82.6		98.4
H	0.38		0.48	14.9		18.8
L	0.3		0.6	11.8		23.6
M	0		0.1	0		3.9
N	0.3		0.65	11.8		25.6
O	0.09		0.17	3.5		6.7